

**GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
LOKSABHA
UNSTARRED QUESTION NO. 1882
TO BE ANSWERED ON FRIDAY, 30TH JULY, 2021**

CYCLONES IN ARABIAN SEA

1882. SHRIMATI RANJANBEN DHANANJAY BHATT:

Will the Minister of EARTH SCIENCES be pleased to state:

- (a) whether the scientists have predicted occurrence of repeated cyclones due to the increase in temperature of water surface in Arabian Sea;
- (b) if so, whether the Government is contemplating to take steps to address this issue; and
- (c) if so, the details thereof along with the timelines drawn and if not, the reasons therefor?

ANSWER

**THE MINISTER OF STATE (INDEPENDENT CHARGE) FOR
MINISTRY OF SCIENCE AND TECHNOLOGY
AND EARTH SCIENCES
(DR. JITENDRA SINGH)**

- (a) An increase in number of cyclones in the country during the recent years has been observed. The details of number of Cyclones since 2016 are given below.

YEAR	Frequency of Cyclones over			Total number of cyclones	Intensity with that of Severe Cyclones or more
	Arabian Sea	Bay of Bengal	North Indian ocean		
2016	0	4		4	1
2017	1	2		3	2
2018	3	4		7	6
2019	5	3		8	6
2020	2	2	1	5	5
2021 (till June)	1	1		2	2

Also the analysis of past data of cyclones over the North Indian Ocean (Bay of Bengal and Arabian Sea) during the period from 1891 to 2020 indicates that since 1990, frequency of Very Severe Cyclonic Storms has increased in recent few years over the Arabian Sea.

- (b)-(c) All the 9 coastal states (viz., Gujarat, Maharashtra, Goa, Karnataka, Kerala, Tamil Nadu, Andhra Pradesh, Odisha and West Bengal) and the Union Territories along the coasts (viz., Dadara & Nagar Haveli, Daman, Diu, Mahe, Yanam, Puducherry) and the Island Territories (Lakshadweep & Andaman and Nicobar Islands) have well developed Cyclone early warning systems in place. This is achieved via seven Cyclone warning Centers covering the east & west coasts and the Cyclone Warning Division centrally located in India Meteorological Department (IMD) Head Quarters at New Delhi. Details are given below.

Three Area Cyclone Warning Centres (ACWCs) are located at Chennai, Mumbai and Kolkata and four Cyclone Warning Centres (CWCs) are at Thiruvananthapuram, Visakhapatnam, Ahmedabad and Bhubaneswar. The responsibility for operational storm warning work for the respective area rests with the ACWCs and CWCs.

Area of responsibility of ACWCs and CWCs is shown in the Table below.

Centre	Coastal area*	Maritime State/UT
ACWC Kolkata	State: West Bengal UT: Andaman & Nicobar Islands	State: West Bengal UT: Andaman & Nicobar Islands
ACWC Chennai	State: Tamil Nadu UT: Puducherry	State: Tamil Nadu UT: Puducherry
ACWC Mumbai	State: Maharashtra & Goa	State: Maharashtra & Goa
CWC Thiruvananthapuram	State: Kerala & Karnataka UT: Lakshadweep	State: Kerala & Karnataka UT: Lakshadweep
CWC Ahmedabad	State: Gujarat UT: Dadra-Nagar Haveli-Daman-Diu	State: Gujarat UT: Dadra-Nagar Haveli-Daman-Diu
CWC Visakhapatnam	State: Andhra Pradesh	State: Andhra Pradesh
CWC Bhubaneswar	State: Odisha	State: Odisha

*Coastal strip of responsibility extends upto 75 km from the coast line.

In the present scenario, India is second to none, in early warning services as well as in managing the disasters associated with Cyclones. IMD has demonstrated its capability to provide early warning for Cyclones with high precision. With the help of such early warnings, the Government is able to mobilise evacuation operations in a timely manner, thereby saving lives & livelihood. The cyclone forecast accuracy has significantly improved in recent years as has been demonstrated during cyclones Phailin (2013), Hudhud (2014), Vardah (2016), Titli (2018), Fani & Bulbul (2019), Amphan, Nisarga & Nivar (2020) and Tauktae & Yaas (2021). During the recent years, the loss of life has been drastically reduced in the recent years.

It is being planned to further enhance the accuracy of weather forecasts through improving the observational networks and numerical modelling and their timely dissemination in the coming years.

Further, the Government of India has initiated the National Cyclone Risk Mitigation Project (NCRMP) with a view to address cyclone risks in the country. The overall objective of the Project is to undertake suitable structural and non-structural measures to mitigate the effects of cyclones in the coastal states and UTs of India. National Disaster Management Authority (NDMA) under the aegis of Ministry of Home Affairs (MHA) will implement the Project in coordination with participating State Governments and the National Institute for Disaster Management (NIDM). The Project has identified 13 cyclone prone States and Union Territories (UTs), with varying levels of vulnerability.

The main objective of the NCRMP is to reduce vulnerability of coastal communities to cyclone and other hydro meteorological hazards through:

- (i) improved early warning dissemination systems.
- (ii) enhanced capacity of local communities to respond to disasters.
- (iii) improved access to emergency shelter, evacuation, and protection against wind storms, flooding and storm surge in high areas.
- (iv) strengthening the Disaster Risk Management (DRM) capacity at central, state and local levels in order to enable mainstreaming of risk mitigation measures into the overall development agenda.
